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10/538,593	06/09/2005	Kim Rishoj Pedersen	GRP-0123	3758

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EXAMINER	
TRAN, CON P	

ART UNIT	PAPER NUMBER
2614	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/538,593	PEDERSEN ET AL.	
	Examiner	Art Unit	
	CON P. TRAN	2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *02/07/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 1, 7, 19 and 23 are objected to because of the following informalities:

Claim 1, line 9 recites "may be", which is deemed not a positive limitation. The same remarks applied to Claim 19, line 2 and Claim 23, line 2;

Claim 7, line 2: "biquatic" should be - - biquadratic - -.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. **Claims 1-6, 9-15, and 20-21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Goff U.S. Patent 6317117 in view of Liu U.S. Patent 6163789 (cited by Applicants).

Regarding **claim 1**, Goff teaches a parametric equalizer (parametric equalizer including shelf filters, Figs. 8c, 11b, 12c, 13c, 14c, 15c, 16b, 17b; col. 1, lines 10-19; col. 3, line 65 – col. 4, line 15) comprising:

filtering means (FM) (including bell filter, shelf filter, bandpass filter, notch filter; see col. 1, lines 10-19; col. 8, lines 27-37), user interface means (UIM) (keys 50-54, Fig. 7; col. 6, line 66 – col. 7, line 6), said filtering means comprising at least one filter block (FIB) (shelf filter 8c, 13c, 14c, 15c; col. 7, lines 6-22, lines 48-55);

said user interface means (UIM) (50-54, Fig. 7; col. 6, line 66 – col. 7, line 6) comprising means for adjustment (increase, decrease; col. 3, lines 47-52) of parameters: corner frequency (fc) (Fig. 8c; col. 7, lines 9-15), shape (Q) (Fig. 12c; col. 7, lines 40-47) and gain (G) (10b, 11b; col. 7, lines 25-39, col. 8, lines 37-47),

said parametric equalizer comprising further means for adjusting a parameter (using the combination of user interface keys 50-54, Fig. 7) independent to the other user parameters (gain, shape, center frequency) which is continuously varied in order to provide a smooth transition (by using user interface 50-54, Fig. 7 to change the active region gain, active region frequency to obtain shelf or bell-shaped filter, see Figs. 13a, 13c; col. 6, line 66 – col. 7, line 6; col. 7, lines 47-55) between low-shelf (Fig.8c; col. 7, lines 9-15; Figs. 9c, 15c; col. 7, lines 14-22; col. 8, lines 8-26), bell-shaped (Fig. 12a; col. 7, lines 40-47) and high-shelf filter (the high-shelf is not shown; it is understood that “a decrease in the transition frequency in the case of a shelf filter” implied low-shelf and/or high-shelf ; see col. 7, lines 14-22; "two or more filters of each type may be included in the apparatus”, see col. 8, lines 49-53) characteristic of said at

least one filter block (FIB) (shelf filters; col. 1, lines 10-19; col. 3, line 65 – col. 4, line 15).

Goff does not explicitly disclose audio signal input means and audio signal output means and the parameter being symmetry parameter.

Liu discloses a digital audio system utilizing a digital parametric equalizer with symmetrical cut and boost spectrums having Audio card (28), digital Filter (30), see Figs. 3, 5, 6, 7, 9; col. 1, lines 6-9; col. 3, lines 35-37, lines 57-61; col. 4, lines 39-48).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the digital audio system taught by Liu with the a parametric equalizer of Goff to obtain the audio signal input means and audio signal output means as claimed for purpose of providing substantially symmetrical cut and boost spectrums, as suggested by Liu in column 2, lines 3-5.

Regarding **claim 2**, Goff in view of Liu teaches the parametric equalizer according to claim 1. Goff in view of Liu, as modified, further teaches wherein said user interface means (UIM) (keys 50-54, Fig. 7, see Goff) comprises a further symmetry adjustment parameter (SYM) for establishing a variable symmetry of the magnitude response (see Liu, Fig. 6; col. 4, lines 39-48) of said at least one filter block (FIB) (using the combination of user interface keys 50-54, Fig. 7, see Goff),

said user interface means is mapped by means of coefficient adjustment algorithms into filter coefficient settings (FCS) (transfer function F(z), see Liu col. 1, lines 12-50) of the at least one filter block (FIB) (shelf filters; see Goff col. 1, lines 10-19;

col. 3, line 65 – col. 4, line 15), which when established reflects the adjustment of the user interface means (UIM) (pushing user interface keys 50-54, Fig. 7, see Goff),

said further adjustment parameter (SYM) provides a filter coefficient setting (FCS) (cut, boost, see Liu, Fig. 9; col. 5, lines 11-31) comprising a combined adjustment of at least one zero frequency, pole frequency, zero Q and pole Q of the magnitude response of said at least one filter block (pole and zero of transfer function F(z), see Liu col. 1, lines 12-50).

Regarding **claim 3**, Goff in view of Liu teaches the parametric equalizer according to claim 2. Goff in view of Liu, as modified, further teaches wherein said user interface means facilitates adjustment of corner frequency (fc) (Fig. 8c; see Goff, col. 7, lines 9-15), shape (Q) (Fig. 12c; see Goff, col. 7, lines 40-47) and gain (G) (10b, 11b; see Goff, col. 7, lines 25-39, col. 8, lines 37-47) and symmetry (see Liu, Fig. 6; col. 4, lines 39-48) (see Goff, using the combination of user interface keys 50-54, Fig. 7).

Regarding **claim 4**, Goff in view of Liu teaches the parametric equalizer according to claim 2. Goff in view of Liu, as modified, further teaches wherein said filter coefficient settings (FCS) comprise digital coefficients (of digital parametric equalizer, see Liu col. 7, lines 50-60).

Regarding **claim 5**, Goff in view of Liu teaches the parametric equalizer according to claim 2. Goff in view of Liu, as modified, further teaches wherein said filter

coefficient settings (FCS) comprise analogue values established by means of adjustable or selectable filter components of said at least one filtering means (see Liu, Fig. 8; col. 4, lines 62-67).

Regarding **claim 6**, Goff in view of Liu teaches the parametric equalizer according to claim 2. Goff in view of Liu, as modified, further teaches wherein said filtering means comprises less than twenty individually adjustable filter blocks (FIB) (two filters for each type; see Goff, col. 8, lines 48-53).

Regarding **claim 9**, Goff in view of Liu teaches the parametric equalizer according to claim 1. Goff in view of Liu, as modified, further teaches wherein said filtering means is analogously implemented (see Liu, col. 4, lines 62-67).

Regarding **claim 10**, Goff in view of Liu teaches the parametric equalizer according to claim 1. Goff in view of Liu, as modified, further teaches wherein said filtering means is digitally implemented (col. 3, lines 35-37).

Regarding **claim 11**, Goff in view of Liu teaches the parametric equalizer according to claim 2. Goff in view of Liu, as modified, further teaches wherein said filtering means comprises gain compensation means adapted for compensation of alteration of the filtering block gain invoked by a changed setting of the further adjustment parameter (boost gain, see Goff; col. 1, lines 32-37).

Regarding **claim 12**, Goff in view of Liu teaches the parametric equalizer according to claim 2. Goff in view of Liu, as modified, further teaches wherein said filtering means comprises corner frequency compensation means adapted for compensation of alteration of the corner frequency of the filtering block invoked by a changed setting of the further adjustment parameter (increase in the corner frequency, see Goff; col. 7, lines 17-22).

Regarding **claim 13**, Goff in view of Liu teaches the parametric equalizer according to claim 1. Goff in view of Liu, as modified, further teaches wherein said user interface provides at least four different asymmetries of filter setting at least in part of the frequency range (low-shelf, in frequency and in amplitude, see Goff, Figs. 8c, 9c, 10b, 11b; col. 7, lines 6-39).

Regarding **claim 14**, Goff in view of Liu teaches the parametric equalizer according to claim 2. Goff in view of Liu, as modified, further teaches wherein said further adjustment parameter (SYM) enables the user to gradually transform the filter block (FIB) between a low-shelf and a high-shelf filter characteristic (by using combination of user interface keys 51, 53, 50, 54, Fig. 7; see Goff, Figs. 8c, 9c, 10b, 11b; col. 7, lines 6-39; the high-shelf is not shown; it is understood that “a decrease in the transition frequency in the case of a shelf filter” implied low-shelf and/or high-shelf ;

see col. 7, lines 14-22; "two or more filters of each type may be included in the apparatus", see col. 8, lines 49-53).

Regarding **claim 15**, Goff in view of Liu teaches the parametric equalizer according to claim 2. Goff in view of Liu, as modified, further teaches wherein said further adjustment parameter (SYM) enables the user to gradually transform the filter block (FIB) from a low-shelf (Fig.8c; see Goff, col. 7, lines 9-15; Figs. 9c, 15c; col. 7, lines 14-22; col. 8, lines 8-26) into a bell-shape (Fig. 12a; col. 7, lines 40-47; by using user interface 50-54, Fig. 7 to change the active region gain, active region frequency to obtain shelf or bell-shaped filter, see Figs. 13a, 13c; col. 6, line 66 – col. 7, line 6; col. 7, lines 47-55, see Goff) and further into a high-shelf (the high-shelf is not shown; it is understood that "a decrease in the transition frequency in the case of a shelf filter" implied low-shelf and/or high-shelf ; see col. 7, lines 14-22; "two or more filters of each type may be included in the apparatus", see Goff, col. 8, lines 49-53), thus defining at least one more than said three standard filter types (see Goff, col. 1, lines 10-19; col. 3, line 65 – col. 4, line 15).

Regarding **claim 20**, Goff in view of Liu teaches the parametric equalizer according to claim 2. Goff in view of Liu, as modified, further teaches wherein the adjustment parameters are converted into filter coefficient settings (FCS) triggered by setting of the adjustment parameters by the user (pressing interface keys 50-54, Fig. 7, see Goff, col. 6, line 66 – col. 7, line 6).

Regarding **claim 21**, Goff in view of Liu teaches the parametric equalizer according to claim 20. Goff in view of Liu, as modified, further teaches wherein the conversion of adjustment parameters into filter coefficient settings is invertible (i.e., the values of the first and second tuning coefficients can be calculated given values for the equalizer parameters: center frequency and bandwidth; see Liu, col. 1, lines 30-32).

Regarding **claim 23**, Goff in view of Liu teaches the parametric equalizer according to claim 1. Goff in view of Liu, as modified, further teaches wherein given filter coefficient settings are converted into corresponding adjustment parameters (i.e., the values of the first and second tuning coefficients can be calculated given values for the equalizer parameters: center frequency and bandwidth; see Liu, col. 1, lines 30-32).

4. **Claims 7-16-17, and 22** are rejected under 35 U.S.C. 103(a) as being unpatentable over Goff U.S. Patent 6317117 in view of Liu U.S. Patent 6163789 (cited by Applicants), and further in view of Alfred et al. U.S. Patent 6876750 (hereinafter, Alfred").

Regarding **claim 7**, Goff in view of Liu teaches the parametric equalizer according to claim 1. Goff in view of Liu, as modified, further teaches a second-order digital all-pass filter implementation of a parametric audio equalizer (see Liu, col. 1, lines 12-13).

Goff in view of Liu does not explicitly disclose wherein at least one of said filtering blocks comprise a biquadratic filter.

Alfred discloses an apparatus and method for generating digital filter (col. 2, lines 66-67) comprising equalization filer algorithm (Fig. 7; col. 7, lines 39-45); and a biquadratic filter (see Fig. 8, col. 8, lines 48-60).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the apparatus and method for generating digital filter taught by Alfred with the a parametric equalizer of Goff in view of Liu such that wherein at least one of said filtering blocks comprise a biquadratic filter as claimed for purpose of providing automatic equalization, as suggested by Alfred in column 2, lines 60-61.

Regarding **claim 16**, Goff in view of Liu teaches the parametric equalizer according to claim 1. Goff in view of Liu Goff in view of Liu does not explicitly disclose wherein a number of said adjustment parameters corresponds to a number of non-trivial degrees of freedom of the at least one filter block (FIB).

Alfred discloses an apparatus and method for generating digital filter (col. 2, lines 66-67) comprising equalization filer algorithm (Fig. 7; col. 7, lines 39-45); and a biquadratic filter (see Fig. 8, col. 8, lines 48-60) having transfer function H(z) in Equation (59) where b_0, b_1, b_2, a1, a2 are five filter coefficients (see col. 8, line 49 – col. 9, line 10).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the apparatus and method for generating digital filter taught by Alfred with the a parametric equalizer of Goff in view of Liu such that wherein a number of said adjustment parameters corresponds to a number of non-trivial degrees of freedom of the at least one filter block (FIB) as claimed for purpose of providing automatic equalization, as suggested by Alfred in column 2, lines 60-61.

Regarding **claim 17**, Goff in view of Liu teaches the parametric equalizer according to claim 1. Goff in view of Liu Goff in view of Liu does not explicitly disclose wherein a number of said adjustment parameters is at least a number of non-trivial degrees of freedom of the at least biquad filter block (FIB) times the number of filter blocks (FIB) of said filtering means.

Alfred discloses an apparatus and method for generating digital filter (col. 2, lines 66-67) comprising equalization filer algorithm (Fig. 7; col. 7, lines 39-45); and a biquadratic filter (see Fig. 8, col. 8, lines 48-60) having transfer function H(z) in Equation (59) where b_0, b_1, b_2, a1, a2 are five filter coefficients of each biquadratic filter (see col. 8, line 49 – col. 9, line 10).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the apparatus and method for generating digital filter taught by Alfred with the a parametric equalizer of Goff in view of Liu such that wherein a number of said adjustment parameters is at least a number of non-trivial degrees of freedom of the at least biquad filter block (FIB) times the number of filter

blocks (FIB) of said filtering means as claimed for purpose of providing automatic equalization, as suggested by Alfred in column 2, lines 60-61.

Regarding **claim 19**, Goff in view of Liu teaches the parametric equalizer according to claim 2. Goff in view of Liu does not explicitly disclose wherein the symmetry parameter is set by means of the user interface to at least four different values.

Alfred discloses an apparatus and method for generating digital filter (col. 2, lines 66-67) comprising equalization filer algorithm (Fig. 7; col. 7, lines 39-45); and a biquadratic filter (see Fig. 8, col. 8, lines 48-60) having transfer function H(z) in Equation (59) where b_0, b_1, b_2, a1, a2 are five filter coefficients of each biquadratic filter (see col. 8, line 49 – col. 9, line 10).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the apparatus and method for generating digital filter taught by Alfred with the a parametric equalizer of Goff in view of Liu such that wherein the symmetry parameter is set by means of the user interface to at least four different values as claimed for purpose of providing automatic equalization, as suggested by Alfred in column 2, lines 60-61.

Regarding **claim 22**, Goff in view of Liu teaches the parametric equalizer according to claim 1. Goff in view of Liu does not explicitly disclose wherein

NDOFpar ≥ NDOFcoef, where NDOFpar is the number of adjustable equalizer parameters and NDOFcoef is the number of non-trivial degrees of freedom (fc, G, Q, Sym).

Alfred discloses an apparatus and method for generating digital filter (col. 2, lines 66-67) comprising equalization filer algorithm (Fig. 7; col. 7, lines 39-45); and a biquadratic filter (see Fig. 8, col. 8, lines 48-60) having transfer function H(z) in Equation (59) where b_0, b_1, b_2, a1, a2 are five filter coefficients of each biquadratic filter (see col. 8, line 49 – col. 9, line 10).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the apparatus and method for generating digital filter taught by Alfred with the a parametric equalizer of Goff in view of Liu such that wherein NDOFpar ≥ NDOFcoef, where NDOFpar is the number of adjustable equalizer parameters and NDOFcoef is the number of non-trivial degrees of freedom (fc, G, Q, Sym) as claimed for purpose of providing automatic equalization, as suggested by Alfred in column 2, lines 60-61.

4. **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Goff U.S. Patent 6317117 in view of Liu U.S. Patent 6163789 (cited by Applicants), and further in view of Mercs et al. U.S. Patent 5907623 (hereinafter, "Mercs").

Regarding **claim 8**, Goff in view of Liu teaches the parametric equalizer according to claim 1. Goff in view of Liu does not explicitly disclose wherein said parametric equalizer comprises at least one cascaded biquadratic filters blocks.

Mercs discloses audio digital signal processing and to the use of digital signal processing (col. 1, lines 6-7) comprising three cascaded biquadratic filters (510, 515, 520, see Fig. 5; col. 4, lines 8-11; col. 7, lines 59-60).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the audio digital signal processing taught by Mercs with the parametric equalizer of Goff in view of Liu such that wherein at least one of said filtering blocks comprise a biquadratic filter as claimed for purpose of achieving stable operation, as suggested by Mercs in column 3, line 67 – column 4, line 1.

4. **Claim 18** is rejected under 35 U.S.C. 103(a) as being unpatentable over Goff U.S. Patent 6317117 in view of Liu U.S. Patent 6163789 (cited by Applicants) in view of Mercs et al. U.S. Patent 5907623 (hereinafter, "Mercs"), and further in view of Alfred et al. U.S. Patent 6876750 (hereinafter, Alfred").

Regarding **claim 18**, Goff in view of Liu in view of Mercs teaches the parametric equalizer according to claim 8. Goff in view of Liu in view of Mercs does not explicitly disclose wherein a number of non-trivial degrees of freedom of each of a number of said cascaded filter blocks is at least four.

Alfred discloses an apparatus and method for generating digital filter (col. 2, lines 66-67) comprising equalization filer algorithm (Fig. 7; col. 7, lines 39-45); and a biquadratic filter (see Fig. 8, col. 8, lines 48-60) having transfer function H(z) in Equation (59) where b_0, b_1, b_2, a1, a2 are five filter coefficients of each biquadratic filter (see col. 8, line 49 – col. 9, line 10), i.e., one trivial and four non-trivial degrees.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the apparatus and method for generating digital filter taught by Alfred with the a parametric equalizer of Goff in view of Liu such that wherein a number of non-trivial degrees of freedom of each of a number of said cascaded filter blocks is at least four as claimed for purpose of providing automatic equalization, as suggested by Alfred in column 2, lines 60-61.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Con P. Tran whose telephone number is (571) 272-7532. The examiner can normally be reached on M - F (8:30 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Vivian C. Chin can be reached on (571) 272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/CPT/
December 8, 2009

/Vivian Chin/

Supervisory Patent Examiner, Art Unit 2614